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CAEN DATABASE DOCUMENTATION V1.0
VOLUME TWO
NOTES ON BEHAVIOUR FILES
PART 1 - ACTIVITY SEQUENCES

BY

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ABSTRACT

This second volume in the Canadian CAEN database documentation examines the set of activity sequences of the CAEN behavioural files. The main sections of the documentation include:

a. Supplementary notes which amplify activity sequence explanations in the CAEN Data Users Guide;

b. A summary description of each activity sequence grouped into player and simulation activated categories which are sub-grouped by combat function;

c. A listing of activity sequences which have been renamed to better indicate to players what the activity sequence models; and

d. A detailed description of how each activity sequence functions.

RÉSUMÉ

Ce second volume de la documentation concernant la version canadienne de la base de données de CAEN examine l'ensemble des suites d'activités, lesquelles appartiennent aux fichiers de CAEN régissant le comportement. Les principales sections de la documentation comprennent:

a. Des notes supplémentaires simplifiant les explications des suites d'activités contenues dans le guide de l'usager de CAEN;

b. Une description sommaire de chacune des suites d'activités groupées selon leur mode d'activation (par le joueur on par la simulation) et sous-groupées selon leur fonction au combat;

c. Une liste des suites d'activités qui ont été renommées pour mieux indiquer au joueur ce que la suite d'activités reflète;

d. Une description détaillée du fonctionnement de chaque suite d'activités.

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DOR(J&L)
CAEN DATABASE DOCUMENTATION V1.0
VOLUME TWO – NOTES ON BEHAVIOUR FILES
PART 1 – ACTIVITY SEQUENCES

CHAPTER ONE
SUPPLEMENTARY NOTES AND OBSERVATIONS

INTRODUCTION

1. This is the second volume in the planned DOR(J&L) series of documentation for the Canadian unique CAEN database. This volume of the database documentation provides additional explanatory notes with regard to specific aspects of the activity sequence section of the behaviour files.

2. Activity sequences and group tactics are in many ways the heart and soul of the CAEN simulation. Activity sequences and group tactics provide the means by which players interactively cause opposing units to come into contact, enter into close combat and bring the close combat to some form of conclusion. In order for players and analysts to perform their functions in the best manner possible it was deemed necessary to develop a comprehensive document which would explain in detail how each activity sequence actually worked so that more informed decision making could be made during scenario play. Another aim was to assess how well the current set of activity sequences portrayed Canadian combat drills and procedures so that new activity sequences, where required, could be developed or minor changes in existing ones could be made to bring them more in line with Canadian methods of conducting close combat. This document should be read in conjunction with the appropriate sections in the Data User's Guide.

3. Fortunately the process has provided DOR(J&L) with a much clearer understanding of this most important part of the CAEN simulation. As a result of the review it was apparent that the majority of activity sequences adequately modelled Canadian combat drills and procedures. It was discovered that few activity sequences required changing or were not suitable and that the requirement for new activity sequences to be developed was minimal. The examination also showed that the titles of

some of the activity sequences did not adequately convey what was modelled or were too general in nature to indicate what the activity sequence modelled. In addition it was discovered that some activity sequences possibly contained errors. A list of those activity sequences in which problems are suspected have been forwarded to the British for further review.

NOTES ON THE ACTIVITY INDEX FILE

4. The activity index file is used to define the names of the activity sequences in the system at any given time. Pages 50 and 51 of the CAEN Data User's Guide contain a description of the Activity Index File. Note that the activity index file is very similar in format to other CAEN index files. The file "activity_index.dat" holds all the activities in the order that they will appear on the player's screen. Only those activities flagged in the TRUE/FALSE column of the index as TRUE appear on the player's screen. Activities flagged as FALSE are simulation-activated activities and do not appear on the players' screen. There is no specified list of activities flagged as FALSE. Based on scenario requirements any activity contained in the activity index can be flagged TRUE or FALSE, that is, this part of the activity index is user definable.

5. A typical line in the activity index is as follows:

26. hold fire activities: act_2.dat	TRUE

where: the activity index number is	26
the activity description/title is	hold fire
the file containing the activity commands is	act_2.dat

Note: This activity can be selected interactively by a player by accessing it through the graphical user interface menus of the player's screen during scenario runs because it is set to TRUE in the Activities Index File. Activities set as FALSE do not appear on the player's screen during scenario runs and cannot be accessed interactively.

Users are cautioned not to equate the activity index number with the activity file name. In the example above the "hold fire" activity is not activity 26 but activity 2. Activities can be actioned in a number of ways, for instance in response to certain stimuli, such as "react to mines"; or as part of a group activity, for instance "all to head up". Regardless

of the means of initiating an activity, the activity index number is used, that is, the place (line) of the activity in the activity index, as the identifier for the activity.

ACTIVITY SEQUENCE DATA FILES SUPPLEMENTARY NOTES

6. Pages 52 and 53 of the CAEN Data User's Guide provide a basic description of how activity sequences are constructed and is generally quite clear. However, in the process of examining each of the 84 activity sequences in detail it became apparent that some aspects were not included in the Data User's Guide or that more comprehensive explanations would have been helpful. Aspects which were not included or fully explained in the Data User's Guide are listed below:

a. The explanation of how the next_activity_id parameter is activated is confusing. The part that is confusing is the phrase on p 52 of the Data User's Guide, "can be used when it is possible to break out of the current activity and start a new one". It is not clear under what conditions it is possible "to break out ...". From the examination undertaken it appears that the next_activity_id parameter will be activated only when the "ret_to_prev_act" and "returnable ..." parameters are both set to FALSE. Note also that the number after each of these parameters refers to the activity index number.

b. At times it is confusing what some of the numerical entries in the conditions columns specify or refer to. Generally there is little problem discerning entries which relate to target selection rules or changes in posture. Normally changes in speed are indicated by inserting the desirable numerical speed value i.e. 0.0 to indicate stop. However, there are instances when an integer value between 1 and 4 is used which may not correspond to the speed intended. For example, see activity sequence 81, CHANGE_CURRENT_SPEED_TO_STOP where there is a "1" in the "conditions" column instead of a 0.0 value. It has been assumed that the numerical value refers to one of the column headings in the speed_type parameter in the Unit Data File. It has been assumed that heading "1" refers to "STOP", and "4" would be "RUN". This interpretation seems logical in relation to other base activities in other activity sequences where a similar convention is used.

c. It also appears that comment or explanatory notes can be inserted in any line of an activity sequence by starting the comment in the "conditions" column.

d. Angular definition or measurement referred to in the "conditions" column appear to be in degrees instead of radians.

e. Users can change the description/title of any activity listed in the activity index. This only causes a corresponding change in the list of activities on the player's screen. However, moving the position of an activity in the index could have serious ramifications concerning other occasions where these activities are called. It will be necessary to change the activity index numbers of the other associated activities.

f. Note that in some activity sequences such as 54, "infantry_cut_wire", and 85, "minefield_stop", that within the sequence there are commands (base activities) entitled "invoke tactic". It was assumed that this command might invoke a group activity within the activity sequence. The British were requested to clarify the use of this command. The response indicated that "invoke tactic" does not refer to a group tactic even though there is a small resemblance. When invoked a new activity (tactic) is triggered by a single member of a group (usually when entering a minefield or cutting wire). The triggering unit/member of the group then invokes an activity (tactic) on the other members of the group which is referenced by a number in the conditions column on the same line as the invoke tactic command. This number refers to a number within the activity index which activates the activity sequence referenced by that index number. While the referenced activity is passed on to the rest of the group members the triggering unit does not change to the new group activity. This methodology allows a single member of a group to react to an event in a specific way while the rest of the group can subsequently respond in the same or a different manner.

g. During the course of the examination it was noted that some activity sequences were not identified numerically. The British were asked why they started to use non-numerical activity sequence names. The response

received is as follows. "There are two main reasons for non-numerical activity names. Text names were created because the number within the file names were becoming inconsistent with the activity index numbers. Originally, simultaneous studies were not run, and so there was only one activity directory. As the model has become more widely used, two or more studies could potentially have a different xth activity (developed specifically for that study). To prevent confusion it became necessary to use more unique identifiers. Rigorous version control means that these actions, if appropriate, can be incorporated into the master versions of the code on study closure".

h. The British have provided additional information with regard to the "start_use_df_weapon" and "stop_use_df_weapon" base activities. When the base activity "start_use_df_weapon" is called in an activity sequence the code stores the current activity number and base activity number before the direct fire activity is applied. For example, it would store:

Activity number – 25. (DIRECT FIRE AIM ZONE)
Base activity number – 17 (i.e. line 17 of the activity sequence)

The direct fire activity is then processed. When the base activity "stop_use_df_weapon" is called, the code replaces the direct fire activity numbers with the above stored numbers. This in turn causes the unit to return to the previous position within the starting activity sequence and continue appropriately to the end of the starting sequence. If there is no "start_use_df_weapon" command then the activity values will not be stored. Therefore, CAEN will try to use the default values of zero. This can cause CAEN to crash because the code will try to evaluate activity 0 which does not exist.

j. The British have also provided clarification about what happens when an activity sequence is temporarily interrupted by suppression for instance. For example, assume activity sequence X is interrupted at line 6 by suppression causing the model to initiate a different activity sequence and the return_to parameter of the interrupted sequence is flagged as TRUE. What happens when the unit recovers from the suppression and returns to the original sequence? Where does the original activity sequence restart –

line 1, line 6 or line 7? The response received states that the activity sequence will return to the start (line l) of the original activity. If, for instance, a unit were suppressed just before it was about to fire a shot it would be inappropriate after recovering from the suppression to continue and immediately fire the shot. The unit would have to reassess if it could see and reacquire the target and therefore it would have to return to the start of the activity to reassess detection and acquisition.

ABBREVIATIONS

7. Annex A contains a listing of the abbreviations for some of the most frequently used terms in this document and in the activity sequences themselves.

CHAPTER TWO
DETAILED ACTIVITY SEQUENCE DESCRIPTIONS

PURPOSE OF THE EXAMINATION

8. The CAEN version 3.2 simulation obtained by DOR(J&L) contains 84 activity sequences in the Activities Directory. A brief examination of a small number of activity sequences indicated that players and analysts would benefit by having more information concerning activity sequences available to them. With this in mind a project was undertaken to examine the activity sequences in detail so that:

a. A written record of how each activity sequence functioned could be assembled into a reference document that was intended to achieve two things. Firstly, it was intended to give players a basic knowledge of what each activity sequence was intended to model. Secondly, it would provide analysts with detailed and comprehensive information that would assist them during all stages of a research project but particularly during analysis of output data from scenario runs.

b. DOR(J&L) staff could determine how well the current set of activity sequences portrayed Canadian combat drills and procedures.

c. Having made the determination in sub-para 8b assess if there was a requirement to develop new activity sequences and determine if minor changes to some existing ones could be made to bring them more in line with Canadian methods of conducting close combat.

ADDITIONAL FINDINGS

9. As the examination of the set of activity sequences proceeded it was discovered that:

a. The names or titles of many activity sequences simply did not convey what the activity sequence was intended to model, hence a player could easily input an inappropriate or totally incorrect activity sequence in response to a specific scenario situation.

b. There were several activity sequences with the same title – i.e. DIRECT FIRE; SUPP_FIRE_1 yet each one modeled something different, thus a player was forced to guess which one to choose in a given scenario situation with a high probability that an inappropriate activity sequence could be selected.

c. There were definite errors in some activity sequences and there were others which may not function fully as intended.

10. As a result of the observations above, a list of those activity sequences requiring a nomenclature change was compiled. New, more descriptive titles, were then devised for those activity sequences requiring a nomenclature or title change. Annex B contains this listing.

11. It was further apparent that a short descriptive summary of what each activity sequence actually modelled would be very helpful to players so that they could make more informed and appropriate activity sequence selection during scenario play. Annex C contains a brief summary of each activity sequence. The summaries are organized into player initiated sequences and simulation activated sequences sections which should also help to simplify things. Note also that the original title has been used as the summary title. If there has been a title change the new title has been included at the end of the descriptive summary. See also Annex B to this chapter.

12. Annex D contains a detailed description of how each activity sequence functions. Note that where it became necessary DOR(J&L) has changed speeds both in the activity sequence matrix and in the descriptive text to conform to speeds in the DOR(J&L) database. DOR(J&L) plans on making minor amendments and additions to some activity sequence base activities which will improve or simplify their structure but which will not change how the activity sequence functions. It is anticipated that minor changes will be made to activity sequences 12, 13, 28, 40, 41, 42, 56, 58, 62, 70, 75, 76, 78 and 79. Activity sequences 90 and 91 which deal with reaction to illumination will most likely be changed to more closely model Canadian drills and procedures. Activity sequence 11, line 4 of the activity index will be deleted from the activity index because it is identical to activity sequence 10, line 5 of the activity index. Note also that activity sequences 47 and 48, lines 7 and 8 of the activity index are not going to be used by DOR(J&L) and have been deleted.

13. Over the course of examining each activity sequence in detail a considerable number of questions arose which were passed to the British. The answers/responses to these questions were subsequently incorporated into the appropriate activity sequence descriptive text. Usually the responses provided by the British are not contained in any of the CAEN reference sources. Therefore an effort has been made within each description to indicate where an answer to one of the questions has been incorporated within the text but this has not been possible in all cases.

LIST OF ABBREVIATIONS

act	activity
APC or apc	Armoured personnel carrier
AS	activity sequence
AZ or az	aim zone
cond	condition
cont	continue
DF	direct fire
DT	decision test
DTDF	decision test data file
eng	engagement or engage
FE	fully exposed
HE	high explosive
HU	head up
id	identity or identification
illumn	illumination
inf	infantry
LOS or los	line of sight
LSW or lsw	light support weapons
num	number
obj	objective
prev	previous
ret	return or returnable
rte	route
sel	select(s)
SF or sf	suppressive fire
supp	suppressive or suppress
surv	surveillance
TA or ta	target acquisition
tgt	target
trig	trigger
TSR	Target Selection Rule

ACTIVITY SEQUENCES WHICH HAVE BEEN RENAMED

The following is a list of activity sequences which have had a name/title change:

Activity Sequence 8	HE_SUPPRESSIVE_FIRE to HE_SUPPRESSIVE_FIRE_IN_SURV_ZONE
Activity Sequence 10	NOT_FEELING_VERY_WELL to UNDER_SUPP_FIRE_CHANGE_POSTURE_COVERED
Activity Sequence 18	CHANGE_POSTURE to CHANGE_POSTURE_TO_FULLY_EXPOSED
Activity Sequence 19	CHANGE_POSTURE to CHANGE_POSTURE_TO_CRAWLING
Activity Sequence 20	CHANGE_POSTURE to CHANGE_POSTURE_TO_HEADUP
Activity Sequence 21	CHANGE_POSTURE to CHANGE_POSTURE_TO_COVERED
Activity Sequence 22	BULLET_SUPP_FIRE to BULLET_SUPP_FIRE_IN_SURVEILLANCE_ZONE
Activity Sequence 23	BULLET_SUPP_FIRE to BULLET_SUPP_FIRE_IN_AIM_ZONE
Activity Sequence 24	DIRECT_FIRE to DIRECT_FIRE_CLOSEST_TARGET
Activity Sequence 25	DIRECT_FIRE_AIM_ZONE to DIRECT_FIRE_CLOSEST_TARGET_INSIDE_AIM_ZONE
Activity Sequence 26	DIRECT_FIRE SURV_ARC to DIRECT_FIRE_CLOSEST_TGT_INSIDE_SURV_ARC
Activity Sequence 32	DUCK_AFTER_FIRE_WEAPON to MOVE_AFTER_FIRE_WEAPON
Activity Sequence 43	SUPP_FIRE_1 to DF_OR_SF_BULLET_AIM_ZONE
Activity Sequence 44	SUPP_FIRE_1 to DF_BULLET_OR_SF_HE_AIM_ZONE
Activity Sequence 45	SUPP_FIRE_1 to DF_OR_SF_BULLET_SURV_ZONE
Activity Sequence 46	SUPP_FIRE_1 to DF_BULLET_OR_HE_SF_SURV_ZONE
Activity Sequence 49	SUPP_FIRE_1 to STOP_HU_CHANGE_ARC_DF_OR_SF_BULLET_AIM_ZONE

Activity Sequence 50	DIRECT_FIRE_RANDOM to ATTEMPT_CHANGE_ARC_RUN_DF_EITHER_STOPPED_OR_RUNNING
Activity Sequence 52	SUPP_FIRE_ADVANCE to AIMED_DF_OR_SF_WHILE_ADVANCING
Activity Sequence 55	CHANGE_SPEED_TO_5m/s to CHANGE_SPEED_TO_2.8 m/s
Activity Sequence 60	MOVE_TO_AIM_ZONE to UNIT_NODE_TO_AIM_ZONE
Activity Sequence 61	CANCEL_AZ_RTE_5 m/s to CANCEL_AZ_RTE_2.8 m/s
Activity Sequence 63	WEAPON_SHARING to RUN_WEAPON_SHARING
Activity Sequence 67	PICK_UP_WEAPON to PICK_UP_WEAPON_HEADUP_POSTURE
Activity Sequence 73	SUPP_FIRE_1 to DF_ENG_ARC_ESSENTIAL_OR_HE_SF_AZ
Activity Sequence 74	THE_WORKS to DF_OR_HE_SF_AZ_THEN_X2 BULLET_SF_AZ
Activity Sequence 76	STEP_OUT_AND_SHOOT to STEP_OUT_SHOOT_ARMOUR_TGT
Activity Sequence 77	SHOOT_AND_SCOOT to DF_ARMOUR_FIRST_THEN_RUN_OR_ANY_TGT
Activity Sequence 82	CHANGE_CURRENT_SPEED_TO_SLOW to CHANGE_CURRENT_SPEED_TO_SLOW_OR_CREEP
Activity Sequence 83	CHANGE_CURRENT_SPEED_TO_WALK to CHANGE_CURRENT_SPEED_TO_WALK_OR_CONVOY
Activity Sequence 84	CHANGE_CURRENT_SPEED_TO_RUN to CHANGE_CURRENT_SPEED_TO_RUN_OR_FULL SPEED
Activity Sequence 88	HEAD_UP_DIRECT_FIRE_AND_STOP to STOP_HEAD_UP_DIRECT_FIRE
Activity Sequence 90	RUN_RADIALLY to REACT_FLARE_RUN_RADIALLY
Activity Sequence 91	PERIPHERAL_REACT to REACT_PERIPHERAL_ILLUM_HIDE_THEN_MOVE
Activity Sequence 94	DIRECT_FIRE_RANDOM_UNDAMAGED_VEHICLE to DF_CLOSEST_UNDAMAGED_VEHICLE

PART I – PLAYER INITIATED ACTIVITY SEQUENCES (GROUPED BY COMBAT FUNCTION)

Note: Activity sequences preceded by * indicates that it is an activity sequence which has received a name change.

DIRECT FIRE

Activity Sequence 1	DIRECT FIRE RANDOM. A direct fire event during which a unit looks for a suitable target; if a target is detected it then tries to acquire it and if acquisition is achieved puts aimed fire on the target. Current unit movement and posture parameters are used.
Activity Sequence 7	SNIPER FIRE. This activity sequence represents the surveillance, detection, target acquisition, and direct fire cycle by a sniper unit.
*Activity Sequence 24	DIRECT FIRE. This activity sequence represents a surveillance, target acquisition and direct fire event cycle with the firing unit selecting to fire on the closest acquired enemy unit if more than one enemy unit has been detected and acquired. This activity sequence has been renamed to DIRECT FIRE CLOSEST TARGET.
*Activity Sequence 25	DIRECT FIRE AIM ZONE. This activity sequence represents a surveillance, target acquisition and direct fire event cycle with the firing unit firing on the closest enemy unit within its current aim zone if more than one enemy unit has been detected within the current aim zone. Detected units (targets) outside of the engagement arc will NOT be selected for engagement. This activity sequence

has been renamed to DIRECT FIRE CLOSEST TARGET INSIDE AIM ZONE.

*Activity Sequence 26 — DIRECT FIRE SURV ARC. This activity sequence represents a surveillance, target acquisition and direct fire event cycle with the firing unit attempting to engage the closest detected unit within its surveillance arc. If there are no detected units within the surveillance arc the unit then attempts to engage any detected unit (target) outside of the current engagement arc. This activity sequence has been renamed to DIRECT FIRE CLOSEST TARGET INSIDE SURVEILLANCE ARC.

*Activity Sequence 43 — SUPP FIRE 1. This activity sequence represents a series of events during which a unit performs surveillance and target acquisition in an attempt to acquire a target and bring aimed fire on the target. If that is not possible the unit initiates bullet suppressive fire within its aim zone. This activity sequence has been renamed to DIRECT FIRE OR SUPPRESSIVE FIRE BULLET AIM ZONE.

*Activity Sequence 44 — SUPP FIRE 1. This activity sequence represents a series of events during which a unit performs surveillance and target acquisition in an attempt to acquire a target and bring aimed fire on the target. If that is not possible the unit initiates HE suppressive fire within its aim zone. This activity sequence has been renamed to DIRECT FIRE BULLET OR HE SUPPRESSIVE FIRE AIM ZONE.

*Activity Sequence 45 — SUPP FIRE 1. This activity sequence represents a series of events during which a unit performs surveillance and target acquisition in an attempt to acquire a target and bring aimed fire on the target. If this is not possible the unit initiates bullet suppressive fire within its surveillance zone. The unit stops moving before conducting aimed fire and then resumes its previous speed while conducting suppressive fire within its surveillance zone. This activity

sequence has been renamed DIRECT FIRE OR SUPPRESSIVE FIRE BULLET SURVEILLANCE ZONE.

*Activity Sequence 46 — SUPP FIRE 1. This activity sequence represents a series of events during which a unit performs surveillance and target acquisition in an attempt to acquire a target and bring aimed fire on the target. If this is not possible the unit initiates HE suppressive fire on a specific aim point. This activity sequence has been renamed DIRECT FIRE BULLET OR HE SUPPRESSIVE FIRE SURVEILLANCE ZONE.

*Activity Sequence 49 — SUPP FIRE 1. This activity sequence represents a series of events during which a unit stops and adopts a head up posture before conducting surveillance and target acquisition within a 30-degree arc. If a target is detected and acquired the unit puts aimed fire on it. If detection and acquisition are not possible the unit then conducts bullet suppressive fire within its 30-degree aim zone. This activity sequence is similar to activity sequences 43 and 45. This activity sequence has been renamed STOP HEAD UP CHANGE ARC DIRECT FIRE OR SUPPRESSIVE FIRE BULLET AIM ZONE.

*Activity Sequence 50 — DIRECT FIRE RANDOM. This activity sequence represents a series of events during which a unit tries to change its surveillance arc to 45 degrees, changes to a running speed thus becoming fully exposed. While moving it conducts surveillance to detect a target and if one is detected it tries to acquire it in order to engage it. Note that depending on the unit's weapon it will either stop to shoot or fire while it is running. This activity sequence has been renamed ATTEMPT CHANGE ARC RUN DIRECT FIRE EITHER STOPPED OR RUNNING.

*Activity Sequence 52 — SUPP FIRE ADVANCE. This activity sequence represents a series of events during which a unit which may or may

not be moving conducts surveillance to detect a target by trying to change its current surveillance arc to a very wide surveillance arc. If it can't change to a wide arc it uses its original arc. If a target is detected it then tries to acquire it and if acquired then engages the acquired target with aimed direct fire. If no target is acquired the unit then lays down suppressive fire within its surveillance zone. Note that depending on the unit's weapon it will either stop to fire or fire while it is moving. This activity sequence has been renamed AIMED DIRECT FIRE OR SUPPRESSIVE FIRE WHILE ADVANCING.

Activity Sequence 71

DIRECT FIRE ENGAGEMENT ARC ESSENTIAL. This activity sequence represents a direct fire process which contains surveillance and target acquisition events but restricts the fire of the unit to acquired targets within the units engagement arc. If no targets are acquired within the engagement arc but other targets are acquired outside the engagement arc the unit is NOT allowed to engage targets acquired outside the arc. This activity sequence is similar to activity sequences 24 and 25.

Activity Sequence 72:

DIRECT FIRE ENGAGEMENT ARC PREFERRED. This activity sequence represents a direct fire process which contains surveillance, and target acquisition events. If there are acquired targets within the unit's engagement arc the unit engages the closest target. If there are no targets within the engagement arc the unit is allowed to engage acquired targets outside its engagement arc.

*Activity Sequence 73

SUPP FIRE 1. This activity sequence represents a series of events during which a unit performs surveillance to detect a target and if a target is detected tries to acquire the target. The unit then engages with direct fire only acquired targets that are inside its engagement arc. If there are no acquired targets the unit then initiates HE suppressive fire within its aim zone. This activity sequence is similar to activity

sequences 43 and 46. This activity sequence has been renamed to DIRECT FIRE ENGAGEMENT ARC ESSENTIAL OR HE SUPPRESSIVE FIRE AIM ZONE.

*Activity Sequence 74

THE WORKS. This activity sequence represents a series of events during which a unit conducts surveillance, target acquisition and direct fire engagement of a target. If direct fire engagement is not possible the unit then lays down HE suppressive fire followed by up to two bullet suppressive fire events. It is similar to activity sequences 43, 44, 45, 46, 49, 52 and 73. This activity sequence has been renamed DIRECT FIRE OR HE SUPPRESSIVE FIRE AIM ZONE THEN X2 BULLET SUPPRESSIVE FIRE AIM ZONE.

*Activity Sequence 76

STEP OUT AND SHOOT. This activity sequence represents a series of events during which a unit conducts surveillance and if a target is detected then tries to acquire it to engage it with direct fire. If an armoured target is acquired and the firing unit is in a building it then moves out of the building to engage the armoured target. Once outside the building it repeats the target acquisition process and if the armoured target is still acquired it fires on it. Having engaged the target the firing unit changes its speed and adopts activity sequence 61 which cancels movement along its aim zone route. If a target other than an armoured target is acquired during the initial surveillance and acquisition process the unit fires on the acquired target regardless whether the unit is inside or outside a building This activity sequence has been renamed STEP OUT SHOOT ARMOUR TARGET.

*Activity Sequence 77

SHOOT AND SCOOT. This activity sequence represents a series of events during which a unit conducts surveillance and target acquisition and if an acquired target is a BMP 3 or T-80 vehicle engages with direct fire and having fired then runs to a new location. If no armoured targets are

available or acquired the unit tries to detect and acquire other types of targets for engagement. This activity sequence has been renamed DIRECT FIRE ARMOUR FIRST THEN RUN OR ANY TARGET.

*Activity Sequence 88

HEAD UP DIRECT FIRE (AND STOP). This activity sequence causes a unit to stop and adopt a head up posture. Having changed speed and posture the unit then continues firing its weapon by automatically switching to a different direct fire activity sequence. This activity sequence has been renamed STOP HEAD UP DIRECT FIRE.

*Activity Sequence 94

DIRECT FIRE RANDOM UNDAMAGED VEHICLES. This activity sequence represents a surveillance event to try to detect undamaged vehicles. If undamaged vehicle(s) are detected the unit then attempts to acquire them and if acquired the unit engages the closest undamaged vehicle. This activity sequence is similar to activity sequence 1. The sequence will continue repeating the process until there are no more acquired undamaged vehicles to engage. If there are no more targets the unit stops firing and continues to observe. This activity sequence has been renamed DIRECT FIRE CLOSEST UNDAMAGED VEHICLE.

Activity Sequence DF_HE

DIRECT FIRE HE. This activity sequence represents a series of events during which a unit with a direct fire HE capability (rifle grenade launcher or AGS-17 type weapon) conducts surveillance and target acquisition in order to engage a target. If a target is acquired the unit engages the target with one round of HE direct fire into the immediate area of the target.

Activity Sequence DF_3X-HE

DIRECT FIRE 3X HE. This activity sequence functions the same as activity sequence DF HE except that it fires 3 vice 1 HE rounds in a direct fire mode at an aim point.

INDIRECT FIRE

Activity Sequence 12

1X HE AIM ZONE. This sequence represents an indirect fire event during which a unit fires/throws one HE round within its aim zone with the intent of suppressing any enemy at or near where the HE lands. This sequence probably is best used to cause a unit to throw a grenade but it can be used to represent the fire of a single mortar or artillery round. (See also activity sequences 8 and 29 which are virtually the same.)

Activity Sequence 13

HE x 3 AIM ZONE. This activity sequence represents the firing by an indirect fire unit, artillery or mortars, of three HE rounds into another units aim zone.

Activity Sequence 14

1 x SMOKE AIM ZONE. This sequence represents an indirect fire event during which a unit throws or fires one smoke grenade or round within its aim zone. It probably is best used to cause a unit to throw a smoke grenade but it can also be used to fire a single artillery or mortar smoke round. (See also activity sequences 8 and 12 which are very similar.)

Activity Sequence 17

1 x FLARE AIM ZONE. This activity sequence represents the firing by artillery or mortar units of a single flare round into another units aim zone.

Activity Sequence 40

1 x SMOKE SURV ZONE. This activity sequence represents an indirect fire event during which a unit throws or fires one smoke grenade or round within its surveillance zone. (It is similar to activity sequences 8 and 12.)

Activity Sequence 41

1 x FLARE SURV ZONE. This activity sequence represents the firing by mortars or artillery of a single flare round into another unit's surveillance zone.

Activity Sequence 42 — HE x 10 AIM ZONE. Activity sequence 42 represents the firing by mortars or artillery of 10 HE rounds into another unit's aim zone.

Activity Sequence 75 — SMOKE X10 AIM ZONE. Activity sequence 75 represents the firing by mortars or artillery of 10 smoke rounds into another units aim zone.

SUPPRESSION BY FRIENDLY UNIT ON ENEMY UNIT

*Activity Sequence 8 — HE SUPPRESSIVE FIRE SURVEILLANCE ARC. An indirect fire event during which a unit fires HE at a specific aim point with the intent of suppressing any enemy at or near the fall of shot. It appears that this activity could be selected for use by artillery/mortar units as well as units armed with grenade launchers but is likely most often to be used for hand thrown grenades. (See also activity sequence 12 which is virtually the same). This activity sequence has been renamed HE SUPPRESSIVE FIRE IN SURVEILLANCE ZONE.

*Activity Sequence 22 — BULLET SUPPRESSIVE FIRE. This activity sequence represents small arms (bullet) fire within a unit's surveillance zone with the intent of suppressing any enemy that happen to be at or near where the bullets traverse. This activity sequence has been renamed BULLET SUPPRESSIVE FIRE IN SURVEILLANCE ZONE.

*Activity Sequence 23 — BULLET SUPPRESSIVE FIRE. This activity sequence represents small arms (bullet) fire within a unit's aim zone with the intent of possibly suppressing any enemy that happen to be at or near where the bullets traverse. This activity has been renamed BULLET SUPPRESSIVE FIRE IN AIM ZONE.

Activity Sequence 29 — HE SUPPRESSIVE FIRE AIM ZONE. This activity sequence represents an indirect fire event during which a

unit throws or fires one HE grenade or round within its aim zone with the intent of suppressing any enemy at or near where the HE lands. This activity sequence probably is best used to cause a unit to throw a grenade but it could be used to represent the fire of a single mortar or grenade launcher round. (See also activity sequences 8 and 12 which are very similar).

SPEED AND POSTURE CHANGE

Activity Sequence 89 — GET UP AND RUN. This activity sequence causes a unit to change from its current posture to a fully exposed posture and to change its current speed to a running speed.

CANCEL ACTIVITIES

Activity Sequence 59 — CANCEL OBJECTIVE ENGAGEMENT. Activity sequence 59 causes a unit firing at its objective to cease firing.

*Activity Sequence 61 — CANCEL AZ RTE 5 m/s. Activity sequence 61 causes the cancellation of a unit's route within its aim zone and also makes a change in the units current speed to a new speed of 2.8 m/s. This activity sequence has been renamed CANCEL AZ RTE 2.8 m/s.

Activity Sequence 62 — CANCEL AZ RTE STOP. Activity sequence 62 causes the cancellation of a unit's route within its aim zone and also stops further movement of the unit.

CHANGE POSTURE

*Activity Sequence 18 — CHANGE POSTURE. This activity sequence causes a unit to change from its current posture to a fully exposed posture. This activity sequence has been renamed CHANGE POSTURE TO FULLY EXPOSED.

*Activity Sequence 19	CHANGE POSTURE. This activity sequence causes a unit to change from its current posture to a crawling posture. This activity sequence has been renamed CHANGE POSTURE TO CRAWLING.
*Activity Sequence 20	CHANGE POSTURE. This activity sequence causes a unit to change from its current posture to a head up posture. This activity sequence has been renamed CHANGE POSTURE TO HEAD UP.
*Activity Sequence 21	CHANGE POSTURE. This activity sequence causes a unit to change from its current posture to a covered posture. This activity sequence has been renamed CHANGE POSTURE TO COVERED.
Activity Sequence 58	HIT THE DECK. This activity sequence causes a unit to change from its current posture to a covered posture. It is similar to activity sequence 21 which is probably the better one to use.

SURVEILLANCE

Activity Sequence 2	HOLD FIRE SURVEILLANCE. An activity/event during which a unit conducts surveillance to detect and acquire targets without firing at any of the targets that might be detected or acquired. Unit current movement and posture parameters are used.
Activity Sequence 6	POP UP SURV. This activity sequence represents a series of events during which a unit in a hold fire state observes several times attempting to detect a target. If a target is detected the unit attempts to acquire it for engagement in the future.
Activity Sequence 53	LOOK 45 AIM ZONE. This activity sequence causes a unit to change its current aim zone arc to an aim zone arc of 45 degrees.

CHANGE SPEED

*Activity Sequence 55	CHANGE SPEED TO 5 m/s. This activity sequence causes a unit to change from its current speed to a speed of 2.8 m/s. The unit's current speed is automatically saved by the simulation for future reference. This activity sequence can be used by infantry and vehicle units. This activity sequence has been renamed CHANGE SPEED TO 2.8 m/s.
Activity Sequence 56	CHANGE SPEED TO 10 m/s. This activity sequence causes a unit to change from its current speed to a speed of 10 m/s. The unit's current speed is automatically saved by the simulation for future use. This activity sequence should only be used by vehicle units.
Activity Sequence 57	CHANGE SPEED TO 0 m/s. This activity sequence causes a unit to change from its current speed to a completely stopped situation. The unit's current speed is automatically saved by the simulation for future use. This activity sequence can be used by infantry and vehicle units.
Activity Sequence 81	CHANGE CURRENT SPEED TO STOP. This activity sequence causes a unit to change from its current speed to a completely stopped situation. The unit's current speed is automatically saved by the simulation for future use. It appears that this activity sequence can be used by infantry and vehicle units. It functions nearly the same as activity sequence 57.
*Activity Sequence 82	CHANGE CURRENT SPEED TO SLOW. This activity sequence causes a unit to change from its current speed to a slow speed which is a very cautious movement rate. It appears this activity sequence can be used by infantry and vehicle units. This activity sequence has been renamed CHANGE CURRENT SPEED TO SLOW OR CREEP.

*Activity Sequence 83

CHANGE CURRENT SPEED TO WALK. This activity sequence causes a unit to change from its current speed to walking speed. It would appear this activity sequence can be used by infantry and vehicle units. This activity sequence has been renamed CHANGE CURRENT SPEED TO WALK OR CONVOY.

*Activity Sequence 84

CHANGE CURRENT SPEED TO RUN. This activity sequence causes a unit to change from its current speed to a running speed. It would appear this activity sequence can be used by infantry and vehicle units. This activity sequence is similar to activity sequence 55. This activity sequence has been renamed CHANGE CURRENT SPEED TO RUN OR FULL SPEED.

CLAYMORES

Activity Sequence 78

FIRE CLAYMORE. This activity represents the deliberate firing of a claymore by a unit using the weapons command firing device. The player manually activates this activity sequence.

Activity Sequence 79

TRIGGER CLAYMORE. This activity represents the remote automatic firing of a claymore anti-personnel weapon as a response to a tactical trigger.

VEHICLE DEBUSS

Activity Sequence 30

CONTROLLED DEBUSS. This activity sequence causes infantry mounted in an APC to dismount (debuss). Units upon debussing immediately return to their previous activity, whatever that is. In most instances it will likely be activity sequence 5, IDLE.

Activity Sequence 51

INDIVIDUAL DEBUSS. This activity sequence causes infantry mounted in an APC to be dismounted by the player individually. It functions exactly the same as activity

sequence 30 except that units debussing immediately respond to the next activity id, which in this instance is activity sequence 52, AIMED_DIRECT_FIRE_ OR_SUPPRESSIVE_FIRE_WHILE_ADVANCING.

MISCELLANEOUS ACTIVITIES

Activity Sequence 5	IDLE	Both these activity sequences represent a state in which a unit remains in a "do nothing" state for a specified period of time. These activity sequences are structured to repeat themselves until a player issues new orders to the unit interactively. This type of sequence is a useful state to put infantry inside APCs into to save computer-processing time.
Activity Sequence 80	INACTIVE	

MISCELLANEOUS MOVEMENT

*Activity Sequence 60	MOVE TO AIM ZONE. This activity sequence causes a unit which is moving as part of a group to deviate from the planned group route to a new individual unit route. A new unit route is automatically created with the target node being set to the centre of the unit's aim zone. This activity sequence has been renamed UNIT NODE TO AIM ZONE.

PART 2 – SIMULATION ACTIVATED ACTIVITY SEQUENCES (GROUPED BY COMBAT FUNCTION)

Note: Activity sequences preceded by * indicates that it is an activity sequence which has received a name change.

DIRECT FIRE

Activity Sequence 27	CONTINUOUS FIRE. This activity sequence represents a response by a unit to enemy fire during which the unit attempts to continue to fire or at least return fire in the direction of the enemy.
Activity Sequence 28	DUCK AFTER FIRE WEAPON. This activity sequence represents a situation where a unit after firing its weapon observes for a short period of time and then attempts to duck to a covered posture to avoid detection and possible return fire.
*Activity Sequence 32	DUCK AFTER FIRE WEAPON. This activity sequence represents a situation where a unit after firing observes for a short period of time before it changes its speed and runs a short distance before it stops again to resume its previous activity. This activity sequence has been renamed MOVE AFTER FIRE WEAPON.
Activity Sequence 70	FIRE WEAPON WITHOUT STOPPING. This activity sequence is called by the simulation weapon data files when a weapon fires in the direct fire mode. After completing a firing sequence the firing unit is automatically returned to its previous activity sequence where it is possible this activity sequence could be recalled/repeated again depending on the scenario situation at that time.

REACTION TO TRIP FLARE

*Activity Sequence 90	RUN RADIALLY. This activity sequence causes a unit regardless of its current posture to change to a fully exposed posture and then run out of the area being illuminated. Having run to a specified point it then stops to determine if it is under peripheral illumination of the flare by going through the process contained in activity sequence 91. This activity sequence has been renamed REACT FLARE RUN RADIALLY.
*Activity Sequence 91	PERIPHERAL REACT. This activity sequence causes a unit to adopt a covered posture and there by also stop to avoid possible detection when it is peripherally illuminated by a point flare. When there is no longer illumination it then gets up and runs out of the area but continuing to search for new targets to engage. This activity sequence has been renamed REACT PERIPHERAL ILLUMINATION HIDE THEN MOVE.

SAVE/RESTORE ACTIVITIES

Activity Sequence 92	SAVE AIM ZONE. This activity sequence causes the simulation to automatically save a unit's current aim zone.
Activity Sequence 93	RESTORE AIM ZONE. This activity sequence causes the simulation to restore automatically a unit's previous aim zone.

SURVEILLANCE

Activity Sequence MU.dat	CHANGE AZ. This simulation initiated activity sequence causes a unit to change its aim zone.
Activity Sequence ARC.dat	LOOK RADIUS AIM ZONE. This activity sequence causes a unit to adopt a surveillance arc which is assumed to be equal to the radius of the unit's aim zone.

SUPPRESSION ON UNIT

*Activity Sequence 10	NOT FEELING VERY WELL. This activity sequence represents a situation where a unit being fired on is suppressed, adopts a covered posture and remains hidden while the suppression dissipates before returning to its **previous** activity. This activity sequence has been renamed UNDER SUPPRESSIVE FIRE CHANGE POSTURE COVERED.
Activity Sequence 65	ILLUMINATION SUPPRESSION. This activity sequence causes a unit to adopt a covered posture upon coming under illumination. Once in the covered posture it conducts surveillance to detect a target and if one is detected it then attempts to acquire it. If the target is acquired it then engages it with aimed direct fire. It repeats this activity sequence until the illumination (suppression) is gone and then returns to its previous activity.

WEAPON SHARING – See Cautionary Note

*Activity Sequence 63	WEAPON SHARING. This activity sequence having been initiated by the simulation causes a unit to change its route to the location of a weapon that it wishes to pick up. The unit ceases its current activity and gets up and runs toward the location of the weapon. As it runs to the new location the unit can continue to fire its weapon. This activity sequence has been renamed RUN WEAPON SHARING.
Activity Sequence 66	CRAWL WEAPON SHARING. This activity sequence having been initiated by the simulation causes a unit to change its route to the location of a weapon that it wishes to pickup. The unit ceases its current activity and crawls along the new route to the location of the weapon to be picked up. As the unit crawls to the new location the unit can continue to fire its weapon.

WEAPON PICKUP – See Cautionary Note

Activity Sequence 64

PICK UP WEAPON. This activity sequence enables a unit engaged in a weapon sharing activity to pick up another weapon having reached the location of the weapon to be picked up. This activity sequence works in conjunction with activity sequences 63 and 66.

*Activity Sequence 67

PICK UP WEAPON. This activity sequence enables a unit engaged in a weapon sharing activity to pick up another weapon having reached the location of the weapon to be picked up. It picks up the weapon from a head up posture. This activity sequence works in conjunction with activity sequences 63 and 66. This activity sequence has been renamed PICKUP WEAPON HEAD UP POSTURE.

Cautionary Note:

With regard to weapon sharing and weapon pick up activities the British have advised that they have not included these activities in their version of CAEN. They have expressed some doubt about their accuracy and validity and have recommended that they not be used. These activities will remain in the Canadian version of CAEN while testing is conducted to determine accuracy and validity.

REACTION TO WIRE

Activity Sequence 54

INFANTRY CUT WIRE. This activity sequence represents the action that a group takes upon encountering wire and is constructed so that the unit encountering the wire and the rest of the group respond differently. The unit encountering the wire stops, adopts a crawling posture and cuts the wire for a period of 60 seconds while the remainder of the group stops, adopts a head up posture and lays down covering fire for the unit cutting the wire. When

the wire is cut the whole group then gets up and runs through the gap in the wire.

REACTION TO MINES

Activity Sequence 85 — MINEFIELD STOP. This activity sequence causes a unit which is part of a group to respond in a specific way while the remainder of the group subsequently responds in the same manner The unit encountering the minefield stops and adopts a head up posture While the encountering unit changes speed and posture the remainder of the group then also stops and adopts a head up posture.

Activity Sequence 86 — IGNORE MINES. This activity sequence instructs the unit to keep going through the minefield regardless of the consequences.

Activity Sequence 87 — REACT MINES. This activity sequence instructs the unit(s) to react to being caught in a minefield. This sequence automatically causes the simulation to invoke activity sequence 86, IGNORE MINES.

MISCELLANEOUS ACTIVITY SEQUENCES

Activity Sequence 3 — FIGHT IN BUILDING. This activity sequence keys the model to supercede the main activity control and uses the special fighting in buildings model in the simulation code to calculate combat inside buildings.

DETAILED DESCRIPTIONS OF ACTIVITY SEQUENCES

1. This annex contains a detailed description of how each activity sequence works that is listed in the activities index contained in the CAEN Version 3 used by DOR(J&L). It also contains: notes on descriptive conventions adopted with regard to the written descriptions; a listing of decision test data files and supplementary notes; a listing of target selection rules and supplementary notes and explanations of activity sequence initial parameter cases.

DESCRIPTION CONVENTIONS

2. The following conventions have been adopted with regard to the written descriptions of the activity sequences:

a. Case convention. At the beginning of each activity sequence there are three parameters, "next_activity_id", "ret_to_prev_act" and "returnable_to" which set conditions or instructions that can be automatically invoked during the processing of an activity sequence. Rather than going through the lengthy process of describing the function of these parameters in each of the 84 activity sequences it was decided to establish sets of these parameters and make reference to the set, which has been called a case. Five cases have been defined each of which has been described in Appendix 1 to this annex. Within the written description of an activity sequence any particular case is referenced by a sentence such as: "See Case A" Appendix 1 to Annex D. Using this type of convention reduces the amount of typing for each activity sequence as well as the amount of space required for each.

b. Phrase Interchangeability. Within the descriptive text of each activity sequence the phrase "moves to base activity#" or "loops back or ahead to base activity#" means read line #. For example, move to base activity 3 means that the reader should now read line 3 of the activity sequence. The

two phrases base activity/line, can be used interchangeably within the descriptive text when referring to line.

DECISION TEST DATA FILES

3. Almost every activity sequence contains one or more decision tests which when applied determine either a TRUE or FALSE result which then causes the activity sequence to move to whatever line in the activity sequence is specified in the TRUE or FALSE result columns. Within an activity sequence, decision tests are simply referenced by a number in the "test_id" column without any indication of what the decision test is or tests. Appendix 2 to Annex D contains a listing of all decision tests (DTs) but this listing does not contain the structure of each test. Note that in the description of the majority of activity sequences the text contains reference to DTs by number as well as brief explanation of the test being conducted to help the reader understand what is happening. One or more DTs can be used in an activity sequence and any DT can be used more than once in the same activity sequence. See the Data User's Guide pp 52-53 and pp 63 to 70 for additional information concerning DTs.

TARGET SELECTION RULES

4. Used in conjunction with some decision tests are various Target Selection Rules (TSRs) which define all the target and aim point rules. TSRs are listed in the "conditions" column of an activity sequence as a number. The number identifies which TSR is applied. Appendix 3 to Annex D contains a listing of all TSRs but does not contain the structure of each rule. Note that in the description of activity sequences which use TSRs the text contains a brief explanation of the target selection conditions or limitations the referenced TSR applies in the activity sequence. One or more target selection rules can be used in an activity sequence and any TSR can be used more than once in the same activity sequence. See the Data User's Guide pp 71-77 for additional information concerning TSRs.

DEFINITION OF SELECTED TERMS

5. There are terms used in activities sequences and target selection rules for which there are no definitions in the CAEN set of reference manuals. The terms for which definitions were not available are: aim point; aim zone; surveillance zone; surveillance arc; and engagement arc. Players and analysts require a clear definition of these terms in

order to understand what these terms mean when used in titles and command statements of activity sequences or in target selection rules explanations and descriptions. The British were asked to provide definitions for these terms. Definitions for the terms as provided by the British are as follows:

a. Aim point – The point on the ground at which the model aims a weapon.

b. Aim zone – The gamer defined area into which prophylactic fire may be placed. Aim zones can apply to units or groups.

c. Surveillance zone – Area defined by left and right of arc and minimum and maximum suppressive range. May be used to carry out linked activities such as df/sf_surv_aim_zone.

d. Surveillance arc – Arc defined by left and right of arc, into which a unit's primary attention will be focused.

e. Engagement arc – Similar to surveillance arc, but linked to specific activities.

WEAPON FIRING SUPPLEMENTARY NOTES

6. In activity sequences in which a weapon will be fired the firing is ordered in the activity sequence by one the base activities (commands) "fire_weapon", "start_use_df_weapon" or "start_use_sf_weapon" (See pp 58 and 61 of the Data User's Guide.) The British have supplied information which provides additional insight concerning what happens when these base activities are invoked in an activity sequence. When these commands are invoked the direct fire or suppressive fire activity identifier (See pp 19 and 21 of the Data User's Guide) stored in the Weapons Data Files is used/referenced. Usually the activity identifier in the Weapons Data File is identifier 13, CONTINUOUS_FIRE (i.e. activity sequence 27) and the suppressive fire activity identifier is identifier 16, FIRE_ON_MOVE (i.e. activity sequence 70). CONTINUOUS FIRE automatically causes the unit to stop to fire whereas FIRE ON THE MOVE does not. Units armed with wire guided anti armour weapons always come to a stop to fire even if activity identifier 16 is used. The detailed activity sequence description makes reference to this note as appropriate.

ACTIVITY SEQUENCE INITIAL PARAMETER CASES

CASE A

1. Each activity sequence matrix contains one change to and two resumption activity parameters (see pp 52-53 of the Data User Guide for an explanation of each). In this activity sequence these parameters have been flagged as follows:

a. the "next_activity_id" parameter is flagged as activity sequence identifier "X". This means that depending how the other two parameters are flagged and how and at what point the current activity sequence ends it may be possible for the simulation to switch automatically to activity index number "X" as indicated by this parameter.

b. the "ret__to_prev_act" parameter is flagged as FALSE which means that after completion of this sequence the unit will not automatically return to the last activity sequence it was carrying out (see pp 52-53), if the "act_id" and "test_id" columns are set to zero.

c. The "returnable_to" parameter has been flagged as TRUE which means if this activity sequence is temporarily interrupted, for example, by enemy suppressive fire, then on recovering from the suppression it will automatically return to carry on with its current/parent activity sequence (see pp 78-79).

CASE B

2. Each activity sequence matrix contains one change to and two resumption activity parameters (see pp 52-53 for an explanation of each). In this activity sequence these parameters have been flagged as follows:

a. the "next_activity_id" parameter is flagged with a "0" which means that it is not possible for the simulation to switch automatically to a completely new activity sequence.

b. The "ret_to_prev_act" parameter is flagged as TRUE which means that after completion of this sequence the unit will automatically return to the last sequence it was carrying out (see pp 52-53), if the "act_id" and "test_id" columns are set to zero.

c. the "returnable_to" parameter has been flagged as FALSE which means if this activity sequence is temporarily interrupted that upon termination of the interruption it will NOT return to carry on with its current/parent activity sequence (see pp 78-79).

CASE C

3. Each activity sequence matrix contains one change to and two resumption activity parameters (see pp 52-53 for an explanation of each). In this activity sequence these parameters have been flagged as follows:

a. the "next_activity_id" parameter is flagged as activity sequence identifier "X". This means that depending how the other two parameters are flagged and how and at what point the current activity sequence ends it may be possible for the simulation to switch automatically to activity index number "X" as indicated by this parameter.

b. the "ret_to_prev_act" parameter is flagged as FALSE which means that after completion of the sequence the unit will not automatically return to the last activity sequence it was carrying out (see pp 52-53), if the "act_id" and "test_id" columns are set to zero.

c. The "returnable_to" parameter has been flagged as FALSE which means if the activity sequence is temporarily interrupted, for example, by enemy suppressive fire, then on recovering from the suppression it will NOT return to carry on with its current/parent activity sequence (see pp 78-79).

CASE D

4. Each activity sequence matrix contains one change to and two resumption activity parameters (see pp 52-53 for an explanation of each). In this activity sequence these parameters have been flagged as follows:

a. the "next_activity_id" parameter is flagged as activity sequence identifier "X". This means that depending how the other two parameters are flagged and how and at what point the current activity sequence ends it may be possible for the simulation to switch automatically to activity index number "X" as indicated by this parameter.

b. the "ret_to_prev_act" parameter is flagged TRUE which means that after completion of this sequence the unit will automatically return to the last sequence it was carrying out, (see pp 52-53) if the "act_id" and "test_id" columns are set to zero.

c. The "returnable_to" parameter has been flagged as FALSE which means if this activity sequence is temporarily interrupted upon termination of the interruption it will NOT return to carry on with its current/parent activity sequence (see pp 77-78).

CASE E

5. Each activity sequence matrix contains one change to and two resumption activity parameters (see pp 52-53 for an explanation of each). In this activity sequence these parameters have been flagged as follows:

a. the "next_activity_id" parameter is flagged as activity sequence identifier "X". This means that depending how the other two parameters are flagged and at what point the current activity sequence ends it may be possible for the simulation to switch automatically to activity index number "X" as indicated by this parameter.

b. the "ret_to prev_act" parameter is flagged as TRUE which means that after completion of this sequence the unit will automatically return to the last sequence it was carrying out (see pp 52-53), if the "act_id" and "test_id" columns are set to zero.

c. the "returnable_to" parameter has been flagged as TRUE which means if this activity sequence is temporarily interrupted, for example, by enemy suppressive fire, then on recovering from the suppression it will automatically return to carry on with its current/parent activity sequence (see pp 78-79).

APPENDIX 2
ANNEX D
DOR(J&L) RESEARCH NOTE RN 9908
OCTOBER 1999

DECISION TEST DATA FILES LISTING

1. The following is a listing of all Decision Tests contained in the CAEN Version 3 Simulation:

DT1	Causes a switch from surveillance to target acquisition if there is at least one non recognized detected target on a unit's detected target list.
DT2	Tests to determine if target acquisition is possible in a specified time of 10 seconds or less
DT3	Checks to determine if line of sight is NOT lost during a target acquisition glimpse by a unit.
DT4	Checks to determine if a unit has finished target acquisition glimpsing.
DT5	Tests clock 1 for 10 seconds.
DT6	Tests to determine if any type of target is present.
DT7	Tests to determine if aim glimpsing is finished.
DT8	Causes a switch from surveillance to target engagement if there are no more non recognized detected targets.
DT9	Tests to determine if a unit has the correct suppressive fire capability (or aim point). (The test is used only after a choose sf_aim point base activity).
DT10	Tests to determine if a unit has seen any flash detections.
DT11	Tests count 1 for 3 occurrences.

DT12	Tests count 1 for 10 occurrences.
DT13	Checks to determine if unit (target) is still recognized.
DT14	Tests to determine if a munition is still in flight at time of testing.
DT15	Tests clock 1 for 20 seconds.
DT16	Tests clock 2 for 120 seconds.
DT17	Tests count 1 for 20 occurrences.
DT18	Tests for random number less than 0.5.
DT19	Tests count 5 for 10 occurrences.
DT20	Tests whether unit (target) is in aim zone.
DT21	Tests whether firing unit is in building.
DT22	Tests count 3 for 5 occurrences.
DT23	Tests count 4 for 5 occurrences.
DT24	Tests for wire.
DT25	Tests for weapon – in this case Claymore.
DT26	Tests that target is NOT dead.
DT27	Tests to determine if unit is illuminated by a point (trip) flare.
DT28	Tests to determine if unit is in peripheral illumination of a point flare.

TARGET SELECTION RULES LISTING

1. The following is a listing of all Target Selection Rules in the CAEN Version 3 simulation:

TSR1	Selects closest unit which can be killed.
TSR2	Selects randomly any unit which can be engaged.
TSR3	Chooses closest unit (target) in aim zone – will NOT engage any unit (target) outside of aim zone.
TSR4	Chooses closest unit (target) in surveillance arc. If no targets in surveillance arc, firing unit is not allowed to choose targets outside.
TSR5	1x HE suppressive fire in surveillance zone
TSR6	1x HE suppressive fire in aim zone
TSR7	1x SMK round in aim zone
TSR8	1x FLARE round in aim zone
TSR9	Bullet suppressive fire into surveillance zone
TSR10	Bullet suppressive fire into aim zone
TSR11	Random selection of targets – anything within 30m first; then anything 30 to 100m; then armour; then light support weapons, or anti-armour

TSR12	Another 1x HE suppressive fire in aim zone (appears to be duplicate of TSR6)
TSR13	Another 1x HE suppressive fire in aim zone rule (appears to duplicate TSRs 6 and 12)
TSR14	1x Smoke round into surveillance zone. Similar to TSR7 but this rule may work with smoke fired by a direct fire weapon in the direct fire mode.
TSR15	1x flare round in surveillance zone. Similar to TSR8.
TSR16	Chooses closest unit (target) in engagement arc. If no targets in engagement arc then firing unit is allowed to choose from targets outside the engagement arc. Similar to TSR4 but condition types are different in TSR16.
TSR17	Chooses closest unit (target) in engagement arc; if no targets available in engagement arc then firing unit is NOT allowed to choose targets from outside the engagement arc. Similar to TSR3 but both "condition types" in TSR17 are different than the two condition types in TSR3.
TSR18	Chooses either BMP3 or T-80; and if neither are available as targets the firing unit is NOT allowed to choose from other targets.
TSR19	Selects closest undamaged unit (target) which can be killed.

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This second volume in the Canadian CAEN database documentation examines the set of activity sequences of the CAEN behavioural files. The main sections of the documentation include:

a. Supplementary notes which amplify activity sequence explanations in the CAEN Data Users Guide;

b. A summary description of each activity sequence grouped into player and simulation activity categories which are sub-grouped by combat function;

c. A listing of activity sequences which have been renamed to better indicate to players what the activity sequence models; and

d. A detailed description of how each activity sequence functions.

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Activity index number
Base activities
Invoke tactic
Name/title change
Player initiated activity sequences
Simulation activated activity sequences
Case convention
Decision test data files
Target selection rule(s)